REMARKS

Rejection of claims 93-98 under 35 U.S.C. 102(e)

The Examiner rejected claims 93-98 under 35 U.S.C. 102(e), over US 2002/0010414 to Coston ("Coston").

Claim 93 recites, *inter alia*, "wherein the control unit is adapted to typically maximize a minimum distance between electrodes into which current is driven during successive time periods." Claim 94 recites, *inter alia*, "wherein the control is adapted to drive the current such that a sum of distances between temporally adjacent ones of the electrodes into which current is driven is typically greater than such sum would be if a sequence of electrodes is generated randomly."

Regarding claims 93 and 94, the Examiner stated:

4. [Claims 93 and 94] Coston teaches an apparatus for facilitating transport of a substance through an area of skin of a subject (figure 4, item 400), the area defining a set of ablation sites (figure 4, item 50), the apparatus comprising: a plurality of electrodes, which are adapted to be placed in contact with the area of the skin at the ablation sites (figure 4, item 16); a control unit (figure 4, item 12), adapted to drive, during successive first, second, and third time periods, a current capable of ablating stratum corneum of the skin to a first one, a second one, and a third one of the electrodes, the first one of the electrodes being non-adjacent to the second one of the

electrodes, and the second one of the electrodes being non-adjacent to the third one of the electrodes, so as to facilitate transdermal transport of the substance (page 7, paragraphs [0068]-[0069]; page 13, paragraph [0122]); wherein the control unit is adapted to drive the current in sequence to typically maximize a minimum distance between electrodes into which current is driven during successive time periods (page 13, paragraph [0122]) and is adapted to drive the current such that a sum of distances between temporally adjacent ones of the electrodes into which current is driven is typically greater than such sum would be if a sequence of electrodes is generated randomly (page 13, paragraph [0122]).

In paragraph [0122], Coston states the following:

> [0122] An advantage of this microprocessor system is that the electrodes can be selectively energized based either on preprogrammed configurations or systematically based on the feedback control. The preprogrammed sequences of electrode firings could consist of sequential, every other electrode, sequential or alternate groups of 2 or 3, random, or any other conceivable combination. The present embodiment utilizes sequential activation starting from the first electrode of the electrode array 124 and then cycling sequentially through all remaining electrodes of the array.

Coston describes several possible sequences of electrode firings in paragraph [0122], namely "sequential, every other electrode, sequential or alternate groups of 2 or 3, random, or any other conceivable combination." However, none of these generally maximizes a minimum distance between ablation sites into which current is driven during successive time periods, as is done by the control unit recited in claim 93 of the present application. For example, using a random sequence, the distance between successive ablation sites is not maximized, nor is it maximized using alternate groups of 2 or 3 electrodes. Furthermore, Coston provides no motivation for maximizing a minimum distance between ablation sites into which current is

driven during successive time periods, as is done by the control unit recited in claim 93 of the present application. Indeed, after describing a list of possibilities with no particular justification for any of them, Coston concludes by stating that "the present embodiment utilizes sequential activation, starting from the first electrode of the electrode array 124 and then cycling sequentially through all remaining electrodes of the array." Therefore, Applicant respectfully submits that claim 93 is not obvious in view of Coston.

Similarly, Coston does not disclose a sum of distances between temporally adjacent ones of the ablation sites being typically greater than such sum would be if the sequence is generated randomly, as is done by the control unit recited in claim 94 of the present application. Furthermore, a person of ordinary skill in the art who read Coston would see no motivation to alter the method described in Coston such that a sum of distances between temporally adjacent ones of the ablation sites into which current is drive is typically greater than such sum would be if the sequence is generated randomly as is done by the control unit recited in claim 94. Therefore, Applicant respectfully submits that claim 94 is not obvious in view of Coston.

Applicant notes that the apparatus claims recite apparatus limitations, some of which are expressed using functional language. MPEP 2173.05(g) states:

> A functional limitation is an attempt to define something by what it does, rather than by what it is (e.g., as evidenced by its specific structure or specific ingredients). There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. In re Swinehart, 439 F.2d 210, 169 USPQ 226 (CCPA 1971).

For example, claim 93 recites a plurality of electrodes and a control unit, "...wherein the control unit is adapted to typically maximize a minimum distance between electrodes into which current is driven during successive time periods." Coston does not describe the apparatus recited in claims 93 and 94, because Coston does not describe the functional limitations recited

in claims 93 and 94. In addition, although the device described in Coston could, in principle, be modified to have the features of the claimed apparatus, there is no suggestion in Coston that the device be modified in this manner, and a person of ordinary skill in the art would see no reason to do so.

Claims 95-98 depend from claim 94, and are therefore of narrower scope than claim 94. Therefore, the Applicant submits that claims 95-98 are allowable over Coston, for the reasons provided hereinabove for the allowability of claim 94 in view of Coston.

Rejection of claims 86-91 under 35 U.S.C. 103

The Examiner rejected claims 86-91 under 35 U.S.C. 103(a), over Coston in view of US 6,024,733 to Eggers ("Eggers").

Regarding claims 86 and 87, the Examiner stated:

> substance (page 7, paragraphs [0068]-[0069]; page 13, paragraph [0122]). Coston does not specifically disclose a method wherein driving the current in the sequence comprises configuring the sequence to generally maximize a minimum distance between ablation sites, wherein a sum of distances between temporally adjacent ablation sites into which current is driven is typically greater than such sum would be if the sequence is generated randomly. However, Eggers teaches a system and method of tissue ablation which discloses a method comprising driving the current in sequence to typically maximize a minimum distance between electrodes into which current is driven during successive time periods, such that a sum of distances between temporally adjacent ones of the electrodes into which current is driven is typically greater than such sum would be if a sequence of electrodes is generated randomly (column 15, lines 26-39). It would have been obvious to one of ordinary skill in the art at the time of the

As stated in Eggers' Abstract, Eggers is generally concerned with the following system and method:

> A system and method for surface tissue ablation on the patient's outer skin, such as the epidermis or the underlying dermis. An electrosurgical probe (130) comprises a shaft (132) having an array of active electrodes (136) on its distal tip and a connector (134) at its proximal end for coupling the electrode array to a high frequency power supply. An electrically conducting liquid is directed along a fluid flow path (142) past a return electrode surface (138) to the target site to provide a current flow path between the target site and the return electrode. High frequency voltage is then applied to the active and return electrodes so that an electric current flows from the active electrode, through a layer of vapor formed at the tip of the electrode, and to the return electrode through the current flow path provided by the electrically conducting liquid. The high frequency voltage will preferably be sufficient to establish high electric field densities between the active electrode array and the epidermal tissue to thereby induce molecular breakdown or disintegration of several cell layers of the tissue.

The portion of Eggers cited by the Examiner (column 15, lines 26-39) states the following:

> Yet another alternative involves the use of one or several power supplies which allow one or several electrodes to be simultaneously energized and which include active control means for limiting current levels below a preselected maximum level. In this arrangement, only one or several electrodes would be simultaneously energized for a brief period. Switching means would allow the next one or several electrodes to be energized for a brief period. By sequentially energizing one or several electrodes, the interaction between adjacent electrodes can be minimized (for the case of energizing several electrode [sic] positioned at the maximum possible spacing within the overall envelope of the electrode array) or eliminated (for the case of energizing only a single electrode at any

one time).

Thus, in the cited portion of Eggers, Eggers provides two alternative methods for minimizing or eliminating interaction between adjacent electrodes that are used to drive a current into electrically conducting liquid on a subject's tissue. The methods are as follows:

(1) Sequentially energizing one electrode at a time. This is performed by energizing a first electrode for a brief period, and then using switching means to energize the next electrode for a brief period.

(2) Sequentially energizing sets of several electrodes, the electrodes within each set being positioned at the maximum possible spacing within the overall envelope of the electrode array. This is performed by energizing a first set of electrodes for a brief period, and then using switching means to energize the next set of electrodes for a brief period.

It is noted that in the first method, in which electrodes are sequentially energized, the method does not include energizing electrodes that are maximally spaced from each another. It is further noted that Eggers states that the first method **would eliminate the problem** of adjacent electrodes interacting with one another ("By sequentially energizing one or several electrodes, **the interaction between adjacent electrodes** can be minimized (for the case of energizing several electrode positioned at the maximum possible spacing within the overall envelope of the electrode array) **or eliminated (for the case of energizing only a single electrode at any one time).**"). <u>Thus, based on Eggers, it is unnecessary to maximize the distance between electrodes that are sequentially energized. It is only necessary to maximize the distance between electrodes that are energized at the same time as each other, as part of a set of several electrodes.</u>

<u>Claim 86:</u>

Claim 86 recites, *inter alia*:

(a) "driving current in a sequence into more than one of the ablation sites... the sequence being configured such that, during successive first, second, and third time periods the current is driven into respective first, second, and third ones of the ablation sites ...

(b) "wherein driving the current in the sequence comprises configuring the sequence to <u>generally maximize a minimum distance between ablation sites</u> into which current is driven during successive time periods."

Thus, claim 86 recites a method whereby in addition to driving a current into ablation sites during respective, successive time periods, the minimum distance between ablation sites into which current is driven during <u>successive</u> time periods is generally maximized.

The Applicant respectfully submits that it is not obvious, based upon Coston in view of Eggers, to drive a current such that:

(a) current is driven into ablation sites during respective, successive time periods, <u>and</u>

(b) the minimum distance between ablation sites into which current is driven during successive time periods is generally maximized, as recited in claim 86.

As stated by the Examiner, Coston does not specifically disclose a method wherein driving the current in the sequence comprises configuring the sequence to generally maximize a distance between ablation sites. Based upon Eggers, one would assume that if (a) current is driven into ablation sites during respective, successive time periods, there is no need to drive the current such that (b) the minimum distance between ablation sites into which current is driven during successive time periods is generally maximized, as recited in claim 86.

<u>Claim 87:</u>

Claim 87 recites, *inter alia*:

(a) "driving current in a sequence into more than one of the ablation sites... the sequence

being configured such that, during successive first, second, and third time periods the current is driven into respective first, second, and third ones of the ablation sites …

(b) "wherein a sum of distances between temporally adjacent ones of the ablation sites into which current is driven is typically greater than such sum would be if the sequence is generated randomly."

Thus, claim 87 recites a method whereby in addition to driving a current into ablation sites during respective, successive time periods, the sum of distances between **temporally** adjacent ones of the ablation sites is typically greater than such sum would be if the sequence is generated randomly.

The Applicant respectfully submits that it is not obvious, based upon Coston in view of Eggers, to drive a current such that:

(a) current is driven into ablation sites during respective, successive time periods, and

(b) the sum of distances between **temporally** adjacent ones of the ablation sites is typically greater than such sum would be if the sequence is generated randomly, as recited in claim 87.

As stated by the Examiner, Coston does not specifically disclose a method wherein a sum of distances between temporally adjacent ones of the ablation sites is typically greater than such sum would be if the sequence is generated randomly. Based upon Eggers, one would assume that if current is driven into ablation sites during respective, successive time periods, there is no need to drive the current such that the sum of distances between temporally adjacent ones of the ablation sites is typically greater than such sum would be if the sequence is generated randomly, as recited claim 87.

Claims 88-91 depend from claim 87, and are therefore of narrower scope than claim 87. Therefore, the Applicant submits that claims 88-91 are allowable over Coston in view of

Eggers, for the reasons provided hereinabove for the allowability of claim 87 over the aforementioned references.

The Applicant believes the remarks presented hereinabove to be fully responsive to all of the grounds of rejection and objection raised by the Examiner. In view of these remarks, the Applicant respectfully submits that all of the claims in the present application are now in order for allowance. Notice to this effect is respectfully requested.

Respectfully submitted,

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